REMARKS

Claim Status

Claims 1-8 are currently pending and no amendments have been made.

Claim Rejections – 35 USC §112

In paragraphs 1-9, the Examiner rejected the claims 35 USC §112 based in general upon the functionality of compensation in the instant application of digital maps for satellite signals. An explanation of same appears below. Accordingly, for at least the reasons set out below, reconsideration and withdrawal of the rejections is respectfully requested.

Claim Rejections – 35 USC §102

In paragraphs 5-12, the Examiner rejected claims 1-8 under 35 USC §102(b) as being anticipated by Avila *et al.* (*An overview of Global Positioning System Mission Planner implemented on a personal computer*). Applicant traverses.

In the Office Action, the Examiner presented a query concerning how digital maps compensate for satellite signals in the instant application. The present invention is directed to creating a GPS simulation for a hypothetical ground based motor vehicle traveling along a hypothetical route which is known in advance. Because the route is known in advance, it is possible to draw upon satellite location information and know where particular satellites will be located along all the points of the hypothetical route. In addition, because the route is known in advance, it is possible to draw upon digital maps and know where the hypothetical vehicle will encounter obstructions in its line of sight to the particular satellites. The amount of obstruction can therefore be calculated. On one extreme, when the hypothetical vehicle, traveling along the hypothetical route, enters a tunnel, it will have absolutely no line of sight to any particular satellite. Accordingly, the tunnel portion of the hypothetical route will have a visibility value of zero. The other extreme is a direct and unobstructed line of sight as may be encountered when absolutely no obstructions are present between the vehicle and any particular satellites. Such conditions would be assigned a maximum value (see figure 2 and discussion therefore in the Specification). In between the two extremes are occurrences when the hypothetical vehicle, traveling the hypothetical route encounters a partial obstruction to at least one particular satellite whose line of sight would be available. Such partial obstructions may occur from a mountain or city buildings as depicted in figure 1. As further depicted, while two of the four available satellites are obstructed, another two are available making GPS still reception available, albeit to a lesser degree.

One inventive feature of the present invention lay in making use of the digital map. Because the route is known in advance and because it is known in advance when GPS will be unavailable (e.g. completely obstructed – as in the case of the tunnel above), it is possible for the present invention to fall back upon the digital map in order to provide guidance normally provided by the GPS. Once a GPS signal is again available, the simulation would switch back over to it. Such compensation is possible because the route is known in advance and use is made of digital maps to provide the simulation with a signal which compensates or substitutes for satellite signals which are, in the simulation, at least partially unavailable.

Avila is more concerned with attenuating antenna reception based on the possible presence of jammers. Terrain obstruction is not given such a high consideration. For example, Avila, while relying upon a digital map, ignores the effects of terrain blockage and provides its simulation only with satellites whose views are not obstructed (see col. 13, last paragraph). The terrain blockage is considered in a latter step and the output therefrom is provided as input to the GPS Signal to Noise module (see continuation of col. 13 last paragraph on page 14, first column). It is with the GPS Signal to Noise module that antenna attenuation becomes a concern (see col. 14, second paragraph). Avila's digital map does not compensate or substitute for the satellite reception. The instant claim 1 has been amended to explicitly recite that the digital map provides compensation for an unavailable GPS signal.

As was previously argued regarding the patentable of the claims in view of Avila, Avila discusses a GPS simulation scenario with an aircraft and land based jammers. As set out on pages 13 and 14, consideration of satellite visibility and DOP values, by the visibility module, is a two step process. For an initial step, the simulation is run with a full satellite constellation regardless of any signal obstructions. The obstructions are considered in a second step with respect to a moving user trajectory. Here a detailed run is made and obstructions considered. The obstructions are terrain based and when terrain visibility becomes an issue, a digital trajectory map is employed. The visibility module also keeps track of the four satellites used in generating the GPS scenario. As depicted in Figure 6, satellites are either hidden or visible and used. Output from the visibility module is considered by a GPS signal to noise density module which is used to compute signal strength of each satellite and determine a signal to noise density of the same. The signal to noise density values drive the simulation. Antenna gain may also be set by the (latter) module.

The present invention is directed to generating a GPS simulation scenario wherein the satellite signals strength may be compensated by input from a digital map. The present application has application to motor vehicles for which jammers (herein land based signal obstructions) are known in advance. A digital map is used to preassign values to satellite signal interferences, the values representing a decrease in the amount of signal strength resulting from the interference. Satellite signal interference results from signal obstructions both natural and man made. Partial and total signal obstruction may be encountered by the receiver. In order to compensate for such partial and total obstructions, the present invention turns to the digital map to provide data which would have been otherwise provided by processing the now depleted satellite signal. Accordingly, not only complete but partial signal obstructions may be compensated for without consideration of antenna gain and the like. In addition, the digital map provides a reference to signal obstructions in advance thereby providing the user with the option of circumventing same by choosing other routes. The digital map may be used in selecting best routes tailored to user specification.

In contrast to the present invention, Avila does not rely upon a digital map to provide compensation for partially obstructed satellite signals. Rather, Avila turns to attenuating its antenna and such. Additionally, Avila is applied to aircrafts subject to jammers whose locations are not necessarily known in advance (page 14, third full paragraph). Eventhough Avila does make use of a digital map, the use's primary function is to provide terrain visibility if and when it becomes an issue. The present invention, in contrast, knows in advance of an on-coming obstruction and turns to a secondary source (digital map), in advance, to make up for the level of loss of the satellite signal.

The Examiner has noted that the above distinctions were not shown in the claims. Accordingly, the instant claims have been amended to explicitly recite that the data from the digitized map is used to compensate for obstructed GPS satellite signals with such obstruction known in advance. Such is not disclosed in Avila given that Avila is not aware of the vehicle route in advance and is therefore unable to make use of digital map data as does the present invention. Further, the present invention's digital data set is used to compensate for the obstructed GPS satellite signals whereas in Avila a digital map is used to compensate for terrain visibility, antenna gain and the like. Applicant believes that the claims as now amended show the patentable and distinguishing features of the present invention, at least in view of Avila, and reconsideration and withdrawal of the rejection is respectfully requested.

CONCLUSION

The present response is intended to correspond with the Revised Amendment Format. Applicant understands that with the Revised Amendment Format, the provisions of 37 CFR §1.121 are waived. Should any part of the present response not be in full compliance with the requirements of the Revised Amendment Format, the Examiner is asked to contact the undersigned for immediate correction.

In the event that the transmittal form is separated from this document and the Patent Office determines that an extension of time and/or other relief is required, Applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees in connection with the filing of this document to **Deposit Account No.: 502464** referencing **client reference: 2002P14345US**. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

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